

Title: Ski jump launch trainer (ski jump)

Date: 11/29/2025 - 12/04/2025

Client: Prof. Walter Block and Dr Azam Ahmed

Advisor: Prof. Randy Bartels

Team:

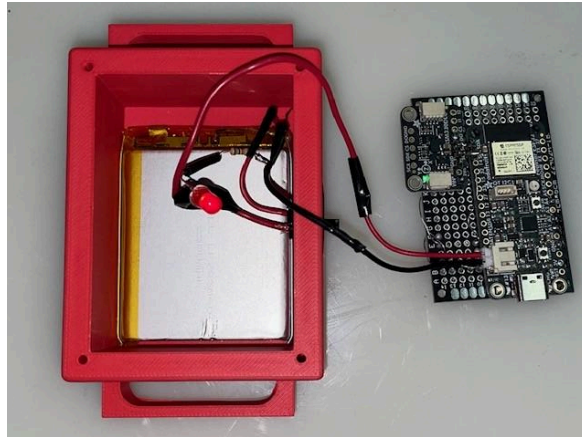
- Team Leader: Kenneth Sun
- BSAC: Caleb White
- Team Communicator: Presley Stellflue
- BPAG: Sarah Kong
- BWIG: Matthew Niemuth

Problem statement: Develop and prototype a comprehensive training system that will allow young skiers learning to jump direct comparison of their technique to professionals utilizing force plates and motion capture.

Brief status update: Now that the semester is coming to an end, the team has been working to put together a poster demonstrating our progress with this project over the semester and present it on Friday December 5th. Additionally, the team has been working to finalize the prototype.

Difficulties / advice requests: N/A

Current design:



Summary of Weekly Individual Accomplishments:

- Kenneth Sun: Finished final design of force insoles. Including electronics, 3d printed housing, and final data analysis graphs.
- Caleb White: Contributed to the teams final poster and finished the fabrication and testing of the force insoles with Kenneth. This included the fabrication of the final force insole, the soldering of the last wires, the drilling of the LED hole and the inclusion of brass threads into the housing unit.
- Presley Stellflue: Contributed to the final poster and practiced presenting the different parts of it.
- Sarah Kong: Contributed to the final poster and brought the velcro strap that serves as the attachment method for the housing unit to the ski boot. Started finished up the BPAG spreadsheet in preparation for the end of this project.
- Matthew Niemuth: I printed our second microcontroller box for the second set of our design. I also contributed to our final poster and practiced my part of it.

Upcoming Team Goals: Present the team's final poster at the symposium and complete the final deliverables of the course. Meet with the client, Dr. Ahmed, as well as Coach Finn, and show them how to use and apply the entire system to the daughter's training at Blackhawk Ski Club.

Upcoming Individual Goals:

- Kenneth Sun: Final report and lab archives.

- Caleb White: Help present the final poster at the symposium and contribute to the team's final report. Finish my personal lab archives for the semester.
- Presley Stellflue: Present the final poster and work on the rest of the final deliverables.
- Sarah Kong: Present the final poster and work on the rest of the final deliverables for the week including the Notebook and Final Report.
- Matthew Niemuth: Present our project at the final poster presentation as well as to our client. Also contribute to finishing our final report for next week.

Materials and expenses:

Item	Description	Manufacturer	Mft Pt#	Vendor	Vendor Cat#	Date	QTY	Cost Each	Total	Link
Motion Capture System										
Tripod with Bag	60 inch lightweight tripod with adjustable-height legs and rubber feet, compatible with smartphone adapters.	Amazon Basics	WT3540	Amazon	B005KP473Q	10/1/2025	2	\$25.99	\$51.98	Amazon Basics Tripod
Tripod Mount Adapter	Smartphone holder, vertical and horizontal mount adapters for smart phones. Pack of 2	Sharing Moment Co.	H-200112	Amazon	B07S8TTH34	10/1/2025	1	\$6.99	\$6.99	Amazon Tripod Mount
Force Plate Insoles + Accelerometers										
Right Force Insole Template	TPU 3D-printed template for force plate insole made of, 18.3 cm long	N/A	N/A	Wendt	N/A	10/10/2025	1	\$0.72	\$0.72	N/A
Right Force Insole Template	PLA 3D-printed template for force plate insole made of, 18.3 cm long	N/A	N/A	Wendt	N/A	10/13/2025	1	\$0.56	\$0.56	N/A
Right Force Insole Template	PLA 3D-printed template for force plate insole made of, 20.8 cm long	N/A	N/A	Wendt	N/A	10/15/2025	1	\$0.59	\$0.59	N/A
Right Force Insole Template	PLA 3D-printed template for force plate insole, dimensions 24.2 cm	N/A	N/A	Wendt	N/A	10/16/2025	1	\$0.80	\$0.80	N/A

	long									
Left Force Insole	PLA 3D-printed template for force plate insole, dimensions 24.2 cm long	N/A	N/A	Wendt	N/A	10/22/2025	1	\$0.80	\$0.80	N/A
Electrical Tape	SWRT 6 Pack Black Electrical Tape 0.75in x 66ft 600V	SWRT		Adafruit	B0DLN GHJZH	10/20/2025	1	\$7.99	\$7.99	AmazonElectricalTape
Copper Tape	Copper foil tape with conductive adhesive 6mm x 15	Adafruit	1128	Adafruit	1128	10/16/2025	1	\$5.95	\$5.95	CopperTape
Velostat Sheet	Pressure-Sensitive Conductive Sheet 28cm x 28cm	Adafruit	1361	Adafruit	1361	10/16/2025	2	\$4.95	\$9.90	Velostat
Accelerometers	ISM330DHCX - 6 DOF IMU - Accelerometer and Gyroscope	Adafruit	4502	Adafruit	4502	10/16/2025	2	\$19.95	\$39.90	Proto-board
ESP32	Adafruit ESP32 Feather Wifi + BT microcontroller	Adafruit	5400	Adafruit	5400	10/22/2025	1	\$19.95	\$19.95	ESP32
LIPO Battery	Lithium Ion Polymer Battery - 3.7V 2500mAh	Adafruit	328	Adafruit	328	10/22/2025	1	\$14.95	\$14.95	LIPO Battery
Proto-Board	PCB Proto-Board 4cm x 6cm 3-pack	Adafruit	4785	Adafruit	4785	10/22/2025	1	\$2.50	\$2.50	Proto-Board
Women's Right Force Insole Templates	PLA 3D-printed template for force plate insole, dimensions: 24.2x8x0.1 cm	N/A	N/A	Wendt	N/A	10/31/2025	2	\$0.54	\$1.08	N/A
Women's Left Force Insole Templates	PLA 3D-printed template for force plate insole, dimensions: 24.2x8x0.1 cm	N/A	N/A	Wendt	N/A	10/31/2025	2	\$0.54	\$1.08	N/A
Men's Right Force Insole Templates	PLA 3D-printed template for force plate insole,	N/A	N/A	Wendt	N/A	10/31/2025	2	\$0.46	\$0.92	N/A

	dimensions: 22.9x7.5x0.1 cm									
Men's Left Force Insole Templates	PLA 3D-printed template for force plate insole, dimensions: 22.9x7.5x0.1 cm	N/A	N/A	Wendt	N/A	10/31 /2025	2	\$0.46	\$0.92	N/A
Housing Unit	PLA 3D-printed housing unit for microcontroller + lid	N/A	N/A	Wendt	N/A	11/18 /2025	1	\$0.99	\$0.99	N/A
Rocker Switch	5pc On/Off Boat Rocker Switch 2 Pin Position Snap 12V			Amazon					\$0.00	
Power Straps	Pack of 2 power straps for ski boots to attach the housing unit to the jumper's boot	ZipFit		ZipFit		11/19 /2025	1	\$40.00	\$40.00	ZipFitPowerStraps
Microcontro ller storage unit + lid V1.	PLA 3D-printed box + lid	N/A	N/A	Wendt	N/A	11/18 /2025	1	\$0.99	\$0.99	N/A
Microcontro ller storage unit + lid V2.	PLA 3D-printed box + lid	N/A	N/A	Wendt	N/A	11/20 /2025	1	\$1.19	\$1.19	N/A
Microcontro ller storage unit + lid V2.	PLA 3D-printed box + lid	N/A	N/A	Wendt	N/A	12/1/ 2025	1	\$1.19	\$1.19	N/A
								TOTAL:	\$211.94	

Timeline:

Task	Sep			Oct					Nov				Dec	
	12	19	26	3	8	17	24	31	7	14	21	28	5	10
Project R&D														
Research	X	X	X	X	X	X	X	X	X	X	X			
Design			X	X	X	X	X	X	X					
Prototyping				X	X	X	X	X	X	X	X	x		
Testings								X	X	X	X	x		
Deliverables														
Progress Reports	X	X	X	X	X	X	X	X	X	X	X	x	x	
PDS		X												
Design Matrix			X											
Prelim Presentation				X										
Prelim Report					X									
Final Poster													x	
Final Report														
Meetings														
Client		X							X		X			
Advisor	X	X	X	X	X	X	X	X	X	X	X		x	
Website														
Update	X	X	X	X	X	X	X	X	X	X	X	x	x	

Filled boxes = projected timeline

X = task was worked on or completed